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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,766	07/19/2001	Wallace T. Y. Tang	5353C2/459005	2971
32588	7590	10/08/2003	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			MACARTHUR, SYLVIA	
			ART UNIT	PAPER NUMBER

1763

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/909,766	Applicant(s) TANG, WALLACE T. Y.	
	Examiner Sylvia R MacArthur	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on the amendment sent 8/25/2003 and interview on 9/22/2003
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 33-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 33-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 14-32 have been cancelled per the interview with Tim Pham on 9/22/03.

Terminal Disclaimer

2. At the time of this action, the terminal disclaimer of record is improper. The application being disclaimed has not been identified. Recall that the examiner contacted Mr. Pham regarding the improper TD. If a new TD was sent please disregard this recommendation.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-6, 8, 11-13, 33, 34, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Birang et al (US 6,537,133)

Regarding claims 1,3, 33, and 37: Birang teaches a method for in-situ endpoint detection for CMP operations utilizing an apparatus comprising a polishing platen 16, a chuck (polishing head 12). Birang cites in col. 8 lines 39-41 that the platen is rotating (is movable relative to the substrate) during CMP this anticipates the presence of a motor as the driving mechanism for rotation. The apparatus of Birang further comprises an endpoint detector comprising a light source generating a light beam 34 that is directed through the polishing (via the platen hole 30,

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optical access) surface to the wafer and produces a light beam reflected from the wafer, and a receiver (detector 48 which is a part of the interferometer 32) is operable to receive the light beam reflected from the wafer and determine the endpoint.

Regarding claim 2, 13: Birang cites the light source is a laser and the light beam is a laser beam col. 6 lines 24-65.

Regarding claim 4: The detector detects the interferometric change in the light reflected from the film and the optical interrupter-type sensor (analyzer) controls the CMP in response the detected interferometric change. See col. 3 lines 28-43.

Regarding claim 5: The data acquisition device (analyzer) analyzes the interferometric chamber is the light reflected from the film to determine a change in dimension of the film.

Regarding claim 6: Col. 10 lines 30-67 describes how that the analyzer analyzes interferometric change in the light reflected from the film using interferometry at one wavelength.

Regarding claim 8: Col. 10 lines 38-45 discusses that interferometric change is the light reflected from the film to determine the thickness of the film.

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Regarding claim 11: Birang discloses that the light source is cast upon the surface of the substrate, inherently as the platen rotates the light hits more than one section of the film, see col. 8 lines 1-21.

Regarding claims 12 and 34: Birang teaches that the wavelength of the laser beam is between far infrared to UV, that is 200 –1100 nm.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9, 10, 35, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birang in view of Kokai (JP 3-234467).

The teachings of Birang were discussed above.

Birang fails to teach a fiber optic cable.

Kokai teaches optical fiber 3c.

Optical fibers are known suitable means of light transport.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to utilize an optical fiber as a means of conveying light in the apparatus of Birang.

7. Claims 7, 9, 10, 35, 36, and 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birang in view of Sarfaty et al (US 6,589,869).

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The teachings of Birang were discussed above.

Regarding claim 7: Birang fails to teach that his apparatus measure using spectrometry over a continuous range of wavelengths.

Sarfaty teaches film thickness control using spectral interferometry. The abstract of Sarfaty cites that a plurality of wavelengths are measured with a spectrometer.

The motivation to modify the apparatus of Birang to include spectrometry is that this type of measurement is cited to yield more accuracy than the conventional one wavelength analysis, see col. 2 lines 46-65.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Birang to include spectrometry over a continuous range of wavelengths as taught by Sarfaty.

Regarding claims 9, 10, 35, and 38-40: Birang fails to teach a fiber optical cable.

Sarfaty teaches a fiber optic cable as the means of conveying light.

Fiber optical cables are known suitable means of conveying light is spectrometric or interferometric measurements.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed skill in the art at the time of the claimed invention to use an optical fiber as a means of conveying light in the apparatus of Birang.

Regarding claim 41: Birang further fails to teach a bifurcated cable.

In col. 4 lines 20-25 Sarfaty teaches that the fiber optic is bifurcated.

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The motivation to use a bifurcated cable is that this type of cable allows the light source to connect to one channel of the cable while the spectrometer is connected to the other. This simplifies the hardware needed to connect the measurement apparatus to the CMP apparatus of Birang.

Thus, it would have obvious for one ordinary skill in the art at the time of the claimed invention to use a bifurcated cable as the type of optical cable in the apparatus resulting from the combined teachings of Birang and Sarfaty.

Regarding claim 46: Birang fails to teach a focusing lens.

Sarfaty teaches a focusing lens 26.

The motivation to provide the focusing lens of Sarfaty in the apparatus of Birang is that ensures that the reflected light passes through the platen across the substrate and into the detector to measure the progress of the CMP operation.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the focusing lens of Sarfaty in the apparatus of Birang.

Regarding claim 36: Birang fails to teach a focusing lens.

Response to Arguments

8. Applicant's arguments with respect to claims 1-13 and 34-41 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R MacArthur whose telephone number is 703-306-5690. The examiner can normally be reached on M-F during the core hours of 8 a.m. and 2 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


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October 1, 2003

Sylvia R MacArthur
Patent Examiner
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